NEURO SOCIOLOGY

IWAO OTSUKA

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Table of Contents

Neurosociology - On the Brain, Nervous System (Neural Network), Society and Culture

1987 (first edition), 1999-2006 (second edition) 2018 (third edition)
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Summary

This book introduces a new view of neuro-physiological psychology in explaining the nature of human society and culture. It proposes a view of society as an accumulation of the nervous system or an exchange of neural circuits between the nervous systems, viewing human nature as the activity of the (brain) nervous system.

Author’s Note: The contents of this site are based on a paper I wrote in 1987, when I was a university student, in the form of an essay. The author has changed it again since 1999 to be more detailed in relation to sociological theory (social structure, communication theory, etc.).

Background.

Living thing, Nervous System, Mind and Society.

The nervous system in living things.
It is a dynamic, organ for the pursuit of ease of living.

The spirit or soul.
They can be seen as the activities of the nervous system.

Every living thing with a nervous system has a spirit or soul.
Living beings with a spirit or soul.
They are not limited to humans.

All living things that are aware of the results of their own actions.
They are capable of consciousness.

All living things that make judgments, decisions, and plans about their own actions.
They are capable of thinking.

All living things that remember and reproduce their own actions.
They are capable of learning.

All of these living things possess a nervous system.
They are all intelligent.
They are not limited to humans.
There is no essential difference between the nervous systems of those living things and the human nervous system.

Living things that are difficult for humans to communicate with.
Internal verification of the nervous system activity of such living things.
That human beings do not attempt to do anything about the act.
In such a situation, humans take the liberty to regard such an living thing as follows.
//
They are mechanical.
They are not intelligent.
They are primitive.
//

Those attitudes are fundamentally false.

Non-human living things.
The nervous systems they possess.
The internal validation of their activities.
Their execution of the following
//
The communication between humans and these living things.
Human understanding of the inner reality of the psyche and society of these living things.
The new possibility of these things.
//
The realization of these things is fundamentally important for the future of biology, psychology, and sociology.

(First published April 2022.)

Foundations - neurosociology.

1987-2006 First published.

The smallest unit of action

Synapse as a Behavioral Element

Human behavior is mainly the function of the nervous system. Now that the idea that brain death (i.e., the cessation of nervous system activity) is considered to be the death of a person has become widespread, it is sufficient to consider only the nervous system when considering the relationship between human behavior and social organization.

The nervous system, which controls human behavior, is a chain of neurons. It can also be considered as a chain or network of neurons (nerve cells). An individual human being can be thought of as a giant neuro-computer.

The human psyche can be viewed as a set of neurons interacting with each other, and in this respect psychology can be called a “sociology of neurons”.

Behavior (in the broad sense) can be said to be the activity in the brain nervous system where impulses are transmitted dynamically over the wiring of neurons statically connected by synapses.

Behavior (in a narrow sense) is considered to be the appearance of the body’s movement as the neural network of sensory and motor areas, which are in contact with the outside world in the brain nervous system, differentiated into sensory, association, and motor areas, is activated by impulse transmission.

Thought is the part of the brain’s nervous system where impulses are dynamically transmitted through the wiring of neurons and continue to persist internally without being outputted externally through the

motor cortex.

Neural circuits can be classified in terms of activation (the presence or absence of impulse passage) as follows.
(1) Active The impulse passes through, corresponding to the action that occurs.
(2) Inactive It does not correspond to the behavior that occurs and does not allow impulses to pass.

When the mode of human behavior is reduced to the activity of neural networks, what determines the mode of behavior is the way of the chain of connections between neurons. The synapses are thought to be responsible for determining how to connect with each other.

The synapses, which control the strength of connections between neurons, are considered to be the behavioral elements (the smallest unit in the nervous system that determines human-organism behavioral patterns).
The human brain nervous system can be considered as a pool of behaviors, a collection point for these various genetic and acquired patterns of behavior.

Relationships with society

Two different ways of looking at society

Society can be considered as a combination, cooperation, and solidarity through communication between individual nervous systems, or as an interaction between individual nervous systems, when the function of the individual nervous system is taken into account. In this context, the neural circuits in each person's nervous system are considered to have been copied from the surrounding neural systems of others.

Apart from the above, the society can be considered as a huge nervous system, or super nervous system, which is the sum of each person's brain nervous system. In this perspective, the nervous system of each individual is fused into one large melting pot called

the total society. In other words, the total society is a single integrated neural network, or neurocomputer, consisting of a large sensory area, association area and motor area.

From this difference in perspective, it can be said that there are two ways of understanding society

a. Whether the perspective is micro or macro.
(1) One in which the perspective is directed to the activities of the nervous system of each individual who makes up the society.
(2) A viewpoint that provides a bird's eye view of society as a whole.

(2) Whether or not the individual and society are separated.
(1) A method of distinguishing and opposing individuals and society as separate and distinct from each other
(2) A method that integrates and fuses the individual into society (the giant nervous system) and views the individual as inseparable.

The micro view of society can be further divided into two types: (1) those that focus on the function of the individual's nervous system and consider society as having only a connective function of the nervous system, and (2) those that focus on society as a state of interaction between the nervous systems of individuals.

From a macroscopic view of society, culture can be considered as a product of society as an integration of the nervous systems of each individual. The creation of new culture can be seen as an event of the creation of new partial neural circuits within the giant nervous system of the whole society. The phenomenon of diffusion and expansion of the generated culture corresponds to the strengthening of the neural circuits of the culture in the whole society. (The neural circuits become thicker and stronger. The number of neural circuits becomes larger and stronger.

Macro neurosociology

1987 (first edition), 1999-2006 (second edition) First published

Defining the Whole Society

The whole society can be viewed as a sum of networks, in which the neural networks of each person are collapsed and the same parts are superimposed on each other.
By collapsing each person's network and adding the same parts to each other, we can form a huge neural network that is close to perfect for human adaptation to the environment as a whole. That is the whole society.
The whole society in this case is one integrated neural network consisting of a huge sensory area, association area and motor area.
The structure of the nervous system of the whole society in this case is homologous to the structure of the nervous system of a person, because the structure of the nervous system of each person is the same. This is because the sum of the structure of the nervous system of each person forms the structure of the nervous system of the whole society.

The sum of each person's brain nervous system (= neural network) is the structure of the whole society. For example, the sum of the visual circuits of each person is the "eye" of the whole society. If the population of the whole world is 5 billion, the total society can be considered as a "superhuman" with 10 billion eyes.

The whole society can be regarded as a large nervous system with huge sensory, associative and motor fields, or as a hyper nervous system or actor.

Definition of group and organization

A group or an organization, which is a group of smaller people than the whole society, can be considered as a sum of the brain nervous system (neural network) of each of its members, just as the whole society is. In other words, a group or an organization of multiple people is considered as a hyperneural system, a large nervous system with integrated sensory, associative and motor areas, just like a single person.
For example, if a company has 500 employees, it can be regarded as a "superhuman" with 1000 eyes.

Stability of social structure and neural circuits

Social structure refers to the stable part of social relations that is difficult to change. It can be considered to correspond to the sum of those parts of the neural network of each of the people who make up the society that are hard to change and stable.

Social change

Variations in the whole society can be seen as changes in the plasticity of the total sum of each person's neural network.
Variations in the individual's psychological system are caused by major changes in the wiring between neurons. This variation in the wiring of individual neurons is thought to be linked to the variation in the social level.
When social change occurs, the pattern of the neural network of each individual in society. When social change occurs, the pattern of the neural network of each person in society, the structure of the neural system is changing significantly.

Conflict.
Conflict occurs when neural networks between humans with opposite facilitation/inhibition relationships between specific parts of the huge neural networks that make up the whole society coexist.
Conflict in the whole society occurs when two parts of the huge neural network with opposite facilitation/inhibition relationships exist, and these opposite parts transmit contradictory impulses that cancel each other out. It is the result of the exhaustion of the countervailing impulses within the whole society.
Supervisor-subordinate relationships in organizations.
If we look at the bureaucracy as a large nervous system, the relationship between superiors and subordinates is interconnected and branch-like. On the other hand, the neural circuits corresponding to the subordinates at the end of the organization correspond to the more concrete and trivial contents of their duties, which are closer to the field. Therefore, the neural circuits can be divided into two types in terms of social organization as follows.
(1) Center and core
(2) Peripheral and terminal

The network corresponding to the subordinate's person is responsible for the circuit part that directly receives the incoming

impulse from the outside world. If it is judged that the amount of impulse information is sufficiently reduced in the supervisor’s part of the network so that the supervisor does not have to report the impulses to his own boss, then the impulse transmission stops.
If the information received by the neural network in the subordinate stage is transferred to the supervisor’s network, the following cases are possible.
(1) The amount of information is large (new and rarely happens before).
(2) High importance in terms of environmental adaptation (it must be a matter of life or death for people and the survival of the organization).

(3) Consideration for isolated people
The whole society can be viewed in two ways, depending on whether or not the isolated person is added to the human society.
(1) To add only neural networks between interacting persons.
(2) To include the neural networks of isolated persons who do not interact with each other.

In this case, it is almost never the case that the isolated person is a wolf boy or girl who had no contact with human society at all from the beginning, but rather, as in the story of Robinson Crusoe, the person who was originally a member of human society and shared human culture but was isolated from others for some reason or voluntarily cut off contact with society. It is normal to think. These isolated people have left their human culture in their own nervous system, and it is more convenient to view the whole society as a member of human society, to the point that their unique experience has the potential to be disseminated again after re-contact with the rest of society.
Alternatively, it is possible that a small group of people who escape from a large number of people may form their own culture completely isolated from the human society in which they have been living. In such a case, one would think that to the sum of the whole society, one would naturally add the portion of their own society to the sum of the whole society.
In these respects, the total society. It would be more convenient to include the isolated persons in (2).

● The sum of the non-plastic and plastic parts of the society.

The non-plastic part of a neural network, whose wiring is predetermined by heredity. There are two types of neural networks: the non-plastic part, which is predetermined by heredity (equivalent to ROM in semiconductors), and the plastic part, which is acquired (culturally) and can be rewired. (The equivalent of RAM in semiconductors). The whole society is genetic. The total society is considered to include all of the genetic, (non-plastic) and cultural (plastic) networks.

Micro neurosociology

The concept of society

1987-2009 First published.
Society as a connector between personal nervous systems
Society, when viewed from the perspective of the functioning of an individual’s nervous system, can be viewed as follows.
(1) Connectivity, cooperation, and solidarity through communication between the nervous systems of each person, or interaction between individual nervous systems.
(2) An aggregate of individual nervous systems

(1) The way I see it, society is only as good as the neural circuitry, which is effective in adapting to the environment, created within the individual. (That we do not yet have that circuitry.) (2) It is merely a means to ensure that it is properly channeled to multiple other human nervous systems. Society can be seen as a bridge or connecting connector between the nervous systems or “minds” of each individual who are independent of each other.
In other words, from a microscopic point of view, society can be viewed as an aggregate of interactions between individual nervous systems and the exchange of neural circuits itself. Human beings can be considered as a kind of neurocomputer from the engineering point of view, and we can say that the modern human society is a swarm of giant neurocomputers interacting and communicating with each other at the same time.
If culture is seen as information that can be transformed into neural circuits, communication can be seen as a state in which culture moves back and forth on the social pathway. Society can be viewed

as an accumulation of neural circuits, or pathways through which culture circulates.

In (2), society can be understood as an aggregate of individual nervous systems, or “minds. The society cannot exist without the individual’s “mind” (i.e. the nervous system). In this regard, in order to understand society, a neuropsychological perspective is essential. In other words, a “neuropsychological sociology” is needed. In that case, the current sociological view that society exists independently of the individual psychology and that it has its own existence beyond the individual psychology will not be valid.

In addition, from the view (2) that society is a collection of individual nervous system activities and psychology, it is possible to view society as encompassing individual psychology, and society can be said to be a superordinate concept that brings together and aggregates the psychology of multiple to many individuals.

In this respect, sociology is a higher-level discipline that encompasses psychology and neuroscience. Frankly speaking, one could say that psychology is a servant of sociology. Or, on top of neuropsychology, comes neurosociology.

This is the same way that the managers who consolidate and manage them collectively are higher in rank in an organization than the individual general employees in a company or something else.

Sociology should be reconstructed from the point of view of including, integrating and integrating individual psychological and nervous system activities in order to respond to future developments in neuroscience.

Socialization and the nervous system

1987-2006 First published.

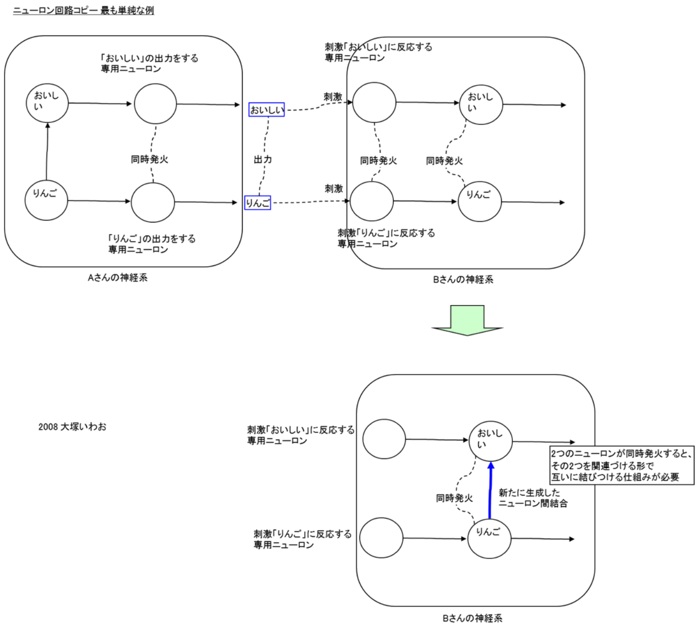
About Circuit Generation

Basics of Circuit Generation
The generation of new neural circuits is based on the simultaneous generation of two different stimuli. For example, when a person eats an apple, both the visual and tactile stimuli of the apple in the hand and the gustatory stimuli of deliciousness are simultaneously triggered. As a result, the neurons corresponding to the apple and the neurons corresponding to the deliciousness of the apple fire simultaneously, resulting in the creation of new connections or circuits between the two neurons.

The basics of circuit copying
The copying of neural circuits between humans is done by loading the media with encoded information that causes two different stimuli to arise simultaneously, sending it to the other person's nervous system to decode it, and consequently coupling the neurons in the other person's nervous system that hit the two relevant stimuli. For example, a person who eats an apple and finds it delicious (the neuronal connections between "apple" and "delicious" are actually obtained by eating it) communicates to the other person verbally that the apple is delicious. (Or, the stimulation of "apple" and "delicious" is simultaneously generated by the picture of the "apple" and the delicious-looking face. This is a very important thing. Then, the neurons that respond to the two stimuli "apple" and "delicious" fire simultaneously in the other person's mind, and the two stimuli are combined, resulting in a copy of the same circuitry in his nervous system as in the person from whom they were transmitted.

In the above case, there must be an active communicative will, a kind of motivation, inside the nervous system of the transmitter to transmit the deliciousness of the apple to others. This communicative will is not always conscious, and it may be communicated to others through unconscious facial expressions. In this respect, it is necessary to assume a "decision-making area" and a "motivational area" in the nervous system.

A diagram illustrating the neural circuit copy. It is as follows.



● A multi-step theory of neural circuit generation (species-based development at the core).

In the generation of neural circuits, the very basic elementary (corresponding to a dictionary definition.) Circuits are generated, and using those circuits as a foundation stepping stone, circuits corresponding to higher-level content information are generated. More advanced neural circuits will be generated by combining plain information/symbols that we already understand = the corresponding neural circuits have been created.

It is not possible to generate circuits related to applied abilities if the elementary and basic circuits have not been established.
In arithmetic, if you can't do four arithmetic operations, you can't understand statistics, then the four arithmetic operations are the portions that are made up of basic circuits, and statistics is the portion of circuits that should be built on the basis of those basic circuits in an applied manner.
In the process of generating neural circuits, it is thought that the basic circuits (seed circuits) are generated first, and then, starting from some seed circuits, they grow into more sophisticated circuits by docking with each other.

Neural circuit coupling and novelty

Connections between neural circuits by humans. (plastic synapses) is what is called “learning”. In this case, the neural circuit connections generated by learning are novelty. (Does it ever already exist in someone else?)
(1) Precedent Neural circuit connections that already exist in someone’s nervous system and can be copied by communication from others who possess them.
(2) Inventions and discoveries Neural circuit connections that did not exist in anyone else’s nervous system until now and were generated for the first time by a learned individual.

There are two types of neural circuit connections: (1) inventions and discoveries.

In the case of invention or discovery (2), the more docking circuits that are more distant and less likely to be connected to each other, the greater the invention or discovery.
From the moment the neural circuit connections corresponding to the invention/discovery are copied by others. (1) To become a precedent for.

The origin and socialization of neural circuits.

There are two types of neural circuits that correspond to acquired learned behavior in humans: (1) external social origin
(1) External social origin When they are formed “extrinsically” in the form of internalizing normative behavioral patterns = neural circuits that already exist from the external society in which the born human being is embedded = internalizing neural circuits = copying them into the brain where no wiring has yet been generated.
(2) Intrinsic to the individual A new neural circuit is generated intrinsically as a new and original behavioral pattern by chance through a process of trial and error in the brain nervous system of an individual human being.
(1) has traditionally been referred to by the concept of “socialization”.

The new intrinsically generated neural circuits in (2) are copied one after another into the surrounding human brain, replacing the old circuits, which is thought to produce social changes such as innovations and revolutions.

Conventional sociology is. Conventional sociology seems to be preoccupied with (1) the internalization of extrinsic patterns of behavior already existing in society in the individual, and fails to consider the impact on society of (2) the transmission of new intrinsic patterns of behavior (i.e., neural circuits) that emerge from the individual's brain to the surroundings.
The neural circuits distributed in society have been repeatedly copied from brain to brain over a long period of time from one generation to the next. If we trace back the history of this circuit copying, it is clear that the first cultural or acquired neural circuitry originated in novel synaptic connections and plasticity in the brain of a single individual. It can be said that these circuits have been copied experimentally to the surrounding human brain through communication, then tested for effectiveness, and if effective, then copied to a wider range of other people's brains, and then copied from one generation to the next, until they are passed down to the present day.
Cultures that already existed in the outside world and were thought to be extrinsically binding on humans, but which, if you trace the source of their copying, originated in the workings of the brain's nervous system, which is an individual psychological phenomenon.
New cultures (creative behaviors) are always born within the individual's internal brain nervous system. Culture originates in the novel connections between neurons in the individual's brain nervous system. In this regard, culture is brought about by the psychological activity of the individual and cannot be external to society from the beginning.
Society is the psychological activity of the individual. It is impossible for a society to generate culture on its own without being based on (the workings of the brain nervous system). Whenever a neural circuit is passed down between individuals by relay, a new circuit is given in the brain nervous system of each individual who receives the circuit, and this part of the circuit is copied to other individuals, and so culture develops. Culture is created. (New neural circuits are added to the system.) It is the individual's own internal psychological process that creates the culture.

In this view of society, it is merely a means of distributing the neural circuits generated by the individual to other human nervous systems that do not yet possess the circuitry that is effective for environmental adaptation. Society is nothing more than a bridge or connecting connector between the nervous systems of each individual who are independent of each other. As a means of

communication between the nervous systems of individuals, society itself is not capable of generating a new culture. It is the individual's nervous system that generates new culture.

Therefore, the concept of "socialization" should be thought of more precisely as the copying of pre-existing, plasticly generated neural circuits from the neural systems of external others that surround us into our own neural system through communication.

The "culture" that is seemingly external to the individual in a way that is beyond the individual's psyche is actually the surrounding (constituting society) that surrounds the individual in question. That it exists in a distributed form within people's brain nervous system, "alive" as a neural circuitry that causes a particular pattern of behavior. The neural circuits that exist in such a distributed manner and correspond to a certain pattern of behavior are communication between individuals and each other. The establishment of (communication lines) allows us to freely cross between multiple human nervous systems.

The two requirements for socialization to occur are 1) the "plurality requirement," which states that no one person alone can duplicate and distribute the neural circuits corresponding to a particular mode of behavior and requires the existence of multiple people, or neural systems, who are in the vicinity of others, and 2) the requirement that neural circuits are duplicated between two or more individuals. Communication between the two people to. (Communication) needs to be established, and society is only the communication in that case. The "communication requirement" is that it is seen as a group of virtual connectors that connect the (communication) lines.

These requirements are by no means inconsistent with the idea that the activity of the nervous system, which is the psychological process of the individual, is the activity of the nervous system, which keeps the neural circuitry, which is the mode of action, alive and allows it to be disseminated to others around it as needed, and that the culture maintained in society is decomposable to the individual's psyche. The sociological view that "socialization" can only be grasped as a framework that goes beyond the individual's psychology is wrong.

● Reduction to the nervous system of society.

The discourse that “society is unique and not reducible to individual psychology. (the emergent nature claim of society) has traditionally worked as the fundamental raison d’être that gives sociologists their identity.

Indeed, society’s function as a connecting connector between the nervous systems of a society cannot be established by the individual’s nervous system alone, but only in the process of establishing a communicative relationship between two or more individuals. In this sense, it is true that there are aspects of society that cannot be reduced to individual psychology. However, the content of culture (the aggregate of human behavioral patterns), which determines the concrete dynamics of society (e.g., “content contents” in the content business, such as books, movies and animations), which is exchanged through the connecting connectors, belongs to the individual’s nervous system as a neural circuit, and therefore In this respect, it is also unreasonable to think of society in terms of individual psychology.

In other words, the contents (cultural content) are all dispersed within the individual’s nervous system (mind), and society can be seen as a passage for the transmission and distribution of contents between individuals.

Traditionally, the functioning of the nervous system has been a black box with little understanding of how it works. Therefore, conventional sociology has been forced to consider the nervous system out of the framework of its theoretical constructs, resulting in a theory that ignores individual psychological processes.

● Phenomenological Sociology and Neural Networks

Phenomenological Sociology. It is a claim that.

- In everyday life, people believe that others do indeed exist, have the same consciousness as they do, and see the world in the same way. As a result, there is a common view among people. (Intersubjectivity) is believed to be established.

This corresponds to the fact that people believe that each other and others have neural systems with common functions and shape patterns as well as themselves. In this case, the inter-subjectivity

corresponds to the common neural circuitry or pattern that exists between people's nervous systems.

Reality does not exist objectively, but is established in conjunction with individual subjectivity. The relationship between the individual and the knowledge that creates "reality" goes through the following stages: (1) Externalization.

(1) Externalization: The process by which human beings work on the world and realize themselves. The production of new knowledge.
(2) OBJECTIVATION The process by which the product of human activity becomes external to the original producer and becomes an objective reality. (Institutionalization of knowledge)
(3) Internalization The process by which institutionalized reality is incorporated into an individual's consciousness and becomes his or her subjective reality. Internalization of institutionalized knowledge.

If we replace this with the functioning of the nervous system, we can say that it represents the following process.

(1) Externalization is the imprinting of a specific neural circuit shape or pattern in a person's nervous system that he or she wishes to copy or disseminate externally. (Subjective content) is imprinted on media outside the nervous system by means of motor organs.

(2) Objectification means that the content and shape of the neural circuitry imprinted on the media outside the nervous system is perceived as an objective reality.

(3) Internalization means that the content and shape of an externally imprinted neural circuit is read by the sensory organs of the nervous system, and the content and shape of the external imprinted neural circuit is read by the sensory organs of the nervous system to create a new neural circuit of the person who reads it. The content and shape of the external imprinted circuitry is read by the sensory organs of the person's nervous system, and a new circuitry is established in the person's nervous system (or a reinforcement of an existing circuitry).

Culture and the nervous system

1987-2006 First published (2014 addendum)

Learning and Neural Circuit Plasticity

There are two ways of coupling between neurons in terms of learning
(1) Fixation = instinct (genetic)
(2) Plasticity = Culture

Instincts are the congenital/genetically unplasticized portion of the static wiring between neurons in the brain nervous system. (The part of the brain that does not change with learning.)
Culture is the congenitally plastic part of the static wiring between neurons in the brain nervous system. Culture is the acquired, plasticized part of the static wiring between neurons in the brain's nervous system.
Learning is the plasticity of neuronal wiring.
The individual's brain can be viewed as a pool of these neural circuits, a "neuron pool". Society can be seen as a collection of these individual active neuron pools and the interactions between them.

Neural network topology

The overall shape, geometry, and topology of a neural network in a person's nervous system (Neural Network Topology) = the immensity of the connections between many neurons that result from the chain of connections between them. The shape pattern of the (neural) network determines a person's perception of the outside world, the functioning of the nervous system, and patterns of behavior, including social behavior.

The part of the neural circuitry that determines the pattern of human behavior that is predetermined genetically is the innate circuitry, while the part that is determined by learning is the learned circuitry.

The traditional view of circuits is that the firing of one neuron is

determined in its meaning by its relative to the firing of all other neurons. (Mach's principle.) Or, the firing of each neuron is a certain stimulus in the external world. (Color, shape…) Corresponding to certain stimuli in the outside world. (Response selectivity.)

On the other hand, it emphasizes the relative or absolute location of each neuron in a large neural network assembly composed and constructed as a whole nervous system, and depending on the location of each neuron in the whole neural network, the meaning of the neuron and its location in the whole nervous system can be determined. The idea of neural network topology is that it determines what kind of stimuli in the external world neurons respond to in a specific way.

● Cultural Content = Neural Circuit Geometry Patterns

Culture, as a behavioral pattern acquired through learning, can be represented as a three-dimensional shape of neural circuits = a geometric pattern.
In that case, perhaps the basic neural circuit patterns are finite, and all cultures can be represented by the combination of these basic neural circuit patterns.

This is the same way of thinking as, for example, Japanese culture can express any number of new contents by combining a finite number of Japanese words.

In this regard, it is crucial to identify the geometric patterns of the basic neural circuits that underlie all cultures in order to elucidate the nature of the relationship between the nervous system and culture.

A new culture is represented as a new variant, a new mutation, or a new addition to the geometric pattern of existing neural circuitry, or a new circuitry that has never been added before.

The above ideas can also be applied to the elucidation of instinctive behavioral patterns, which correspond to unplasticized neural circuits.

The background to the above ideas can be summarized as follows.

The human take. (instinctive and acquired) behavioral patterns can

be expressed by combinations of a finite number of basic behavioral patterns, and every behavioral pattern is reducible to an individual basic behavioral pattern. The basic geometric patterns corresponding to such basic behavioral patterns exist in the nervous system, either as pre-instincts or as a culture through acquired learning. The entire nervous system is made up of such basic circuit patterns that connect and build up each other like blocks.

Cultural elements = plastic synapses

If culture is considered to be an “acquired behavioral pattern (behavioral pattern) of each member of a social group,” according to the conventional definition in sociology, then the cultural element (the smallest unit of behavioral pattern determination through acquired learning) is the synapse that plasticly controls the positive, negative, and strength of the connections between neurons. We can think of it as a

The plastic and static synaptic connections in neural circuits are the culture, and the impulses running over them produce dynamic acquired learning behaviors.

● Relationship to the “meme” concept.

In conventional biology, genes are viewed as objects of environmental selection. In this case, we can think of genes as if they themselves were selfishly motivated to disseminate and perpetuate their own replication as widely as possible. This characteristic has been described by the term “selfish gene”.

Some people believe that this genetic trait is directly applicable to human culture. In other words, they see the smallest unit of human culture as a “meme”, and these “memes” have the propensity to replicate, multiply and survive in as many people as possible.

If we apply the concept of “cultural elements = plastic synapses” to the above explanation of memes, we can think of memes as plastic synapses or the neural circuits that contain them.

The location of culture

Human culture exists dispersed within each person's nervous system. Landscapes, buildings, books, etc. that appear to be independent of each other are in fact all activities of our internal nervous system. (Information processing, etc.) It can be said that human culture exists only within each person's nervous system and is not external. The same content (text, music, etc.) looks completely different when seen and heard by individuals whose nervous systems are different from each other. (Hearing.) That the possibility cannot be denied.

Human culture exists only in the brain. Television images and mobile phone hardware that seemingly exist outside the human body are all captured only through the visual and tactile functions of the human brain.

The dissemination of culture

Human culture, specifically, takes the form of neural networks of behavioral patterns, which are disseminated in the form of multiple living human brains that are crossed over by one human communication after another. This corresponds to what has been called the "cultural virus" concept.

In other words, culture is copied from one person's brain to another as a neural circuit that corresponds to a certain pattern of human behavior. In modern times, these neural circuit patterns are copied from brain to brain in a matter of moments and efficiently among tens to hundreds of millions of humans, primarily through the medium of communication and broadcasting media. Culture as a neural circuit, distributed across multiple brain nervous systems, creates commonalities in the wiring of each person's brain and is a source of empathy and psychological solidarity between humans.

The contents of neural circuits corresponding to behavioral patterns and culture are imprinted on metal, plastic, electricity, etc. outside the body and circulated in the market, and the contents of the imprint are analyzed and interpreted in the brains of other humans who have received the imprint, i.e., the construction of new neural circuits corresponding to the imprint is performed. It is the process by which an ingeniously created culture is spread through the brains of multiple people. This is the process by which an ingeniously created culture spreads through multiple human brains.

Circuit commonality, community and nervous system

1987-2006 First published.

Similarity of Consciousness and Neural Circuits

People of the same mind share the same neural circuitry, or have the same (or similar) structure of their own internal neural circuits. It is believed that the two people share the same neural circuitry or have the same internal neural structure.

If one person feels a sense of similarity in behavior with another person, there is a commonality in the wiring of their neurons.

Those who have the same idea have a common neural circuit (wiring of the nervous system).

Differences in neural circuits.

When comparing the neural systems between multiple humans, neuronal wiring = the way neurons connect to each other can be divided into two ways: (1) Same = common.
(1) Same = common
(2) Difference = non-common

When multiple people have different neuronal wiring from each other in their nervous system, they enter into the following relationship.
(1) Complementary relationship = being in a systems relationship.
(2) They must be in a mutual division of labor relationship. (2) When the neuronal wiring of each person is added together, it results in a total social system consisting of cooperation between parts that are different from each other.
(2) They are mutually heterogeneous and understand each other. (Understanding each other.) (3) The relationship is alienated, unable to

with others.
(1) When the neuronal wiring is common, they can understand and empathize with each other and live in the same living world. They feel a sense of unity and warmth towards each other.
(2) On the other hand, if the wiring is not common, we live in a world that is different from each other.

Differences in values and neuron wiring

In the nervous system between multiple humans, even though the parts corresponding to each other may have the same neuronal wiring, the connections between neurons may exhibit opposite logics, as follows.
(1) Affirmation (promotion)
(2) Denial (suppression)
Physiologically, it corresponds to two different synapses: facilitative and inhibitory.

This is related to the following content on the emotional side.
(1) Pleasure.
(2) Discomfort

If the inter-neuron coupling is positive, it means that we feel good about the coupling; if it is negative, it means that we feel bad about it.

The above affirmation or denial of inter-neuron coupling is related to the following judgments in values.
(1) Value.
(2) Worthless.
If the inter-neuron coupling is positive, it is considered to have value, and if it is negative, it is considered to have no value.

Differences in values, in multiple people, can be viewed as follows.
(1) There is no common circuit. This means that there is no common ground. They are indifferent to each other.

(2) Although the circuits are attached in a common way, the relationship between positive and negative = pleasant and unpleasant in terms of emotions is opposite. (3) They share an interest, but their

opinions clash and are diametrically opposed to each other. The values held are in conflict with each other. The way long-term memory circuits are connected is common, but the way value is assigned by emotions = the way they are promoted and inhibited to synapses is different.

Conflict occurs when two opposite parts of each person's neural circuitry are activated simultaneously.

● Interpersonal humidity (dryness and wetness) and neural circuits

Those who share a common neural circuitry with each other are more likely to feel a sense of oneness and psychologically attracted to each other and come together, saying, "Oh, I'm just like the other person. The fact that people with the same slogan in a social movement or something like that act together in a group and act in unison is a sign that they have a common neural circuit and therefore feel a sense of sameness and unity with each other.

In this regard, it can be said that the commonality of the neural circuits that people have in common gives them an interpersonal wetness that causes them to attach to each other, solidarity and unity. On the other hand, if the neural circuits that people possess feel different from those of others, they feel that they are separate and distinct from others.
On the other hand, it can be said that the differences in the neural circuits of people bring about a dryness in interpersonal relations, which makes people feel separate and apart from each other.

Community Formation and Neural Circuits

It is thought that those who share common neural circuits and a wet sense of sameness will form a community that can be formed by a group of friends who can understand and relate to each other.

Social integration and neural circuits

Those who belong to the same society and the same nation are considered to have a common memory, a common neural circuitry. It

is thought that the commonality and identity of the neural circuits possessed by each person makes it possible to integrate the society on the basis of that common memory.

Alternatively, it is thought that having common neural circuits with each other is a sign of being a member of that society.

Social division of labor and the nervous system

1987-2006 First published.

Functions, Occupations and Neural Circuits

People who perform the same functions, and who are in the same profession, share the same built neural networks with each other. Alternatively, they have the same or approximate neural network structure that they themselves have built in.

Owners of neural circuits, which are responsible for functions important to people's survival, are more socially valued and have higher status.

● Social division of labor and neural circuits

People in the division of labor have different neural pathways from each other. However, the fact that they have different circuits does not mean that they are unrelated to each other.

Each person in the division of labor corresponds to a mode of behavior in environmental adaptation that the others do not have. In this respect, the neural circuits of each person take into account the fact that they provide each other with circuits that the others do not have, and in this respect they are complementary and related to each other.

By adding up the neural circuits of people in each division of labor,

all the functions necessary for human adaptation to the environment (in terms of behavior) come together to form a large, all-mighty nervous system. This is the whole society.

Sparse and specialized neuronal wiring

Neuron wiring can be done in two ways.
(1) High density (dense)
(2) Low density (coarse)
This indicates the degree of specialization of the owner of the neuronal wiring in a particular field.

If it is dense, the owner of the neuronal wiring knows a lot of details about the field that the wiring corresponds to. He or she must be detailed and own it. He or she is meticulous. He or she must be an expert in the field.

If it is coarse, the owner of the neuronal wiring is a layman with only a rough idea of the field that the wiring corresponds to, and can only deal with it in a rough way.

The occurrence of differences in the coarseness of neuronal wiring between people indicates a division of labor among people. There is a limit to the number of neurons each person has, and it is not possible for one person to be proficient in all fields, i.e., to have dense neuronal wiring in all fields. Therefore, it is necessary for each person to have different fields of high wiring density, and to ask others with high wiring density to help them in fields with low wiring density.

For children who are still growing and in the midst of basic learning, their neuronal wiring is only basic and is considered relatively coarse. As learning progresses, branching out from the basic neuronal wiring is likely to lead to the formation of more detailed wiring that is commensurate with specialized abilities.

In addition, people of lower social status are often unable to acquire the behavioral patterns (or neural circuits) necessary for a full social life, and thus lack the ability to do so. Or the neural circuits, no matter how detailed and specialized, are useless and useless to other people, even if they are in possession. (Example. Graduate Doctoral Working Poor.)

Communication and the nervous system.

1987-2006 First published.

Copies of communication and neural circuits

Communication is generally considered to be the transmission of information or messages from one person to another. From the perspective of neural networks, communication can be thought of as a copy of neural circuits from one person to another, or as a two-way exchange of neural circuits. This is because both the sender and receiver share the same neural network, and the exchange of neural circuits between two or more people is the reality of communicative behavior.

External “imprint” of media and neural circuit content

Neural circuits are only active in the body. To copy one person’s neural circuitry to another person, it is necessary for the content of the neural circuitry to leave the body. The media are used to exchange the neural circuits between one person and another person. The media are material and mediate the copying of neural circuits between the two parties. One person is the content of the neural circuit. One person “imprints” the contents of a neural circuit into a substance external to the organism so that the other person can copy it correctly. The other human generates a new neural circuit in his mind, based on the content “imprinted” on the media by the other human, which corresponds to the imprinted content. He reactivates the corresponding neural circuitry, if it has already been learned.

● The concept of information

Information is some pattern that is “imprinted” on a substance external to the organism and perceptible by the organism’s five senses. For example, the fruit of an apple brings a red color to human vision, an appetizing smell to the sense of smell, etc. It often has content that relates to the life and death of an organism. The living organism generates and reactivates the neural circuits

corresponding to the information that is present at any given time.

The “imprinted” information must function effectively. (That it is transmitted from sender to receiver.) For this to happen, it is necessary for the one who “imprints” the information on the external material and the one who receives the “imprinted” information to have a common neural circuit. For example, when information about “apples are delicious” is transferred from one side to the other, if neither the sender nor the receiver has common knowledge and understanding of the Japanese hiragana character string “apples” or “delicious” (for example, in the case of a foreigner who does not know Japanese), the meaning will not be conveyed correctly. , i.e., the correct copy of the neural circuitry linking “apple” and “delicious” does not occur.

The understanding is that the other person, a substance external to the organism. (e.g., a paper notebook) that shows that he has been able to generate and construct a new and correct neural circuit in his own mind that corresponds to the content imprinted on it. In other words, we can say that understanding is the occurrence of an exact copy of a specific pattern of neuronal wiring from one individual to the other. In the case of an incorrect copy, it is a misunderstanding.

The relationship with mass communication

Mass communication, such as television, makes the neural circuits built into the sender’s own neural network contagious to the neural networks of many people at once.

Social movements and the nervous system

1987-2006 First published.

Social Movements

A social movement is the action of one to more than one person attempting to change the neural network configuration of others

around them to what they think is desirable. It can be described as an attempt to spread or infect the neural networks of as many others as possible around one's own neural system with the subcircuits of neurons whose existence is considered to be affirmative.

Synchronized behavior

Tuning refers to the fact that each person changes his or her neural network configuration to the same configuration as that of others.

Environment and the nervous system

1987-2006 First published.

Neural circuits and environmental adaptation

Neural circuits can be divided into two ways.

(1) Necessary for environmental adaptation.
(2) It is involved in the consumption of functions.

In this case, function is a general term for the functions necessary for humans to adapt to the environment and survive. There are two types of circuits: those involved in the generation of functions that are necessary for humans to adapt to their environment, and those that are there to simply consume the functions created by others. The circuits that correspond to the abilities needed to draw comics are different from those needed to read and enjoy comics. In the case of the former, it is necessary to have the function or ability to draw.

Neural circuits can be thought of in two ways in relation to human beings and their environment: (1) The circuits that are effective in adapting to the environment
(1) Produce behaviors that are effective for environmental adaptation, and (2) Produce behaviors that are not effective for environmental adaptation.
(2) Produce behaviors that are not effective for environmental adaptation.

Understanding the macro-whole society from a micro perspective.

2006 First published

It is possible to apply the micro view of society to the macro view of society.

We can think of the whole society as a huge network of neural systems that are connected by communication with each other, which are connected at the micro level.

In this case, the total society is a network of neural systems connected to each other without thinking about it.

In this perspective, we can consider that the micro-society and the macro-society are not separate from each other, but rather they are continuous.

Other.

Thinking, Knowledge, Will, Consciousness and the Nervous System

1987-2018 First published.

The thinking and knowledge areas.

In conventional neuropsychology, the function of the nervous system is divided into two areas: the sensory area, which receives external stimuli as input, and the motor area, which provides an active output to the outside world, and the association area, which is the link between these two areas.

However, this idea of the association cortex merely links the sensory and motor fields. It consists of the following contents: (1) The "knowledge field".
(1) The "knowledge field" as a networked database for accumulating experience and knowledge of the external world extracted from the sensory cortex, as well as experience and knowledge of accurate and efficient modes of movement.
(2) Search, content-checking, and evaluation of the knowledge field as a "thinking field" network-type database, as well as attempting to connect remote neurons that have never been found in the knowledge field.

Signals coming in from the sensory cortex do not go out to the motor cortex immediately, but instead circle around in the head for a while.

In the thinking area, if no effective connections were found in the conventional knowledge area for solving the problem, a trial connection is made between new neurons that have not yet been connected to each other, and the results of that connection are predicted or simulated. Abort and try another coupling. On the other hand, if the results of the simulation are OK, the coupling is tentatively confirmed. Through the action of the motor cortex, the output corresponding to the novel inter-neuron coupling is actually produced externally, from which feedback such as the response of others is obtained through the sensory cortex. If the feedback evaluation results are OK, the new inter-neuron connections are incorporated into the conventional knowledge area as part of the newly acquired effective knowledge.

Decision-making area (motivational area)

In practice, it is also necessary to assume a "decision-making area" or a "motivational area" that independently determines the direction of one's own progress and takes active action. This is the part that motivates thinking and knowledge accumulation. As an organism, human beings voluntarily take action to support life. However, it is necessary to assume that a part of the nervous system is the source of such autonomy (e.g., build a fire when it gets cold). I believe that this is the field that is in charge of "intention (decision)" and "motivation".
The conscious and the unconscious

The state of consciousness is a state in which the neural network receives the external world around it through sensation and perception, and explicitly controls and performs the tasks that it considers viable and effective for survival in response to it. Consciousness behavior is behavior that is in the spotlight of control. In the state of unconsciousness, the neural network does not receive any action from the outside world and does not perform any action output to the outside world. In the dreaming state, each neuron's firing chain is completed by firing in a circular motion inside the neural network. Stroke and brain death are states in which the neurons in the brain are dead and therefore unresponsive. Unconscious behavior is a state of consciousness where the neural network produces uncontrolled or unknowingly outside the spotlight of its external reaction output.

● The existence of behavioral control entities.

A neural network is a control entity, a leader who controls the actions he takes, and a follower who takes specific actions according to his control, neither of which is unique. (Circuit network firing) into three different departments of independent persons who perform independently. The factors that cause unconscious action are either the independents or the followers who act automatically on their own without reflecting the leader's will.

● Focused thought and inattention, human error.

In the neural network, the reader's department first receives sensations or perceptions from the outside world, then decides what to respond to, and finally executes the response, but the attention is not focused at the time of the sensation or perception and is directed elsewhere, and the content received from the sensation or perception becomes blurred or coarse in focus. This is similar to shooting with a camera. This is similar to shooting with a camera. In addition, when deciding on a reaction, we may think about other things that are out of our original purpose or intention. In addition, the final reaction may be inadvertently distracted, and we may not be able to respond fully, or may malfunction in the final reaction action.

In short, the leader parts of the neural network are required for good external reactions and environmental adaptation. In short, in order to respond well to the external world and to adapt to the environment, the neural network leader department must have the necessary capabilities for (1) the sensory and perceptual receiving phase, (2) the response decision phase, and (3) the response execution phase, and must also invest and maintain concentration. The resources of concentration are limited and. There is a limit to the degree to which one must (1) focus on a single pole or target, focus, or spotlight, (2)

focus on a single moment or increase the resolution of concentration, and (3) continue to focus itself, but there is a limit to the degree to which one can do so. This is the same as for video recording with a video camera. If we cannot concentrate in each of these areas, we become inattentive and, by extension, fail to perform the desired action. This is a cause of human error.
The key to acting well in a group is the ability of each neural network to control this concentration of thought as well as the original ability of each neural network to communicate with each other.

Memory, Emotion and the Nervous System

1987-2018 First published.

Relationship to memory
Length of memory

There are two types of connections between neurons.
(1) Long-term.
(2) Short-term
If the connection persists over a long period of time, it corresponds to long-term memory. If the association disappears after a short period of time, it corresponds to the working memory = short-term memory.

Objective and subjective.

(1) Right and wrong Objectively, right or wrong.
(2) Beneficial or useless Objectively useful for one's survival. (3) Positive. Or, being useless. (Harmless, harmful)
(3) pleasant or unpleasant Subjectively, like or dislike.
The neural circuitry can either link individually with each neural circuit and neuron that holds the results of the sensory-perceptual analysis of the above, or it can chemically change each neural circuit and neuron to instantly determine whether the content of each neural circuit and neuron is correct, useful, or liked, and then determine whether it is Retain the results.

There are two possible explanations for this.
(1) The neural circuits of the neural circuits that are responsible for the decision-making process, the usefulness and futility of the decision-making process, and the liking and disliking of the decision-making process, respectively, exist.
The neural circuits and neurons in the neural network have discrete flags for judgments of right and wrong, usefulness and futility, and liking and disliking.

Memory and emotion

The relationship between memory (long-term) and emotions (pleasant and unpleasant) can be established in two ways.
(1) Recalling a certain thing in an unpleasant state.
(2) Remembering one thing and being uncomfortable.
This shows that the neural circuits that receive each other and each other are connected in both directions.

About the social cortex.

1987-2006 First published.

The part of the human nervous system in which knowledge and experience of society is written can be viewed as the social cortex. The social cortex can be further divided into the following areas: (1) the communicative area, which is the area of knowledge and experience of communication that interacts with others.
(1) The “communication area” is the area in which knowledge and experiences of communication, which is the interaction with others, are written down, and thoughts and perspectives are conducted.
(2) The social cognition area, where students write their knowledge and experiences about the whole society, which is the aggregate of others, and their relationships with each other, and where they write their thoughts and perspectives.

(1) Communication area

The two requirements for a society to occur are (1) the “other”,

which means that it is impossible for one person to interact with another person alone and requires the presence of one or more others in the vicinity, and (2) the establishment of a communicative relationship (communication) with the other person is necessary for interaction with the other person to take place. It is the "communication" that Of these, the basis for the emergent nature of society's claim is (2) "communication".

In fact, the process of communication with two or more other people, which is the smallest unit of society, can be divided into the neural circuit exchange activities of the nervous system of each of the several people who perform communication.

In order to establish a communicative relationship, one must first inform the other person that he or she wishes to communicate with the other person. If the other person does not respond, you should remind him/her to do so a certain number of times. When the other person responds with "OK", you consider the relationship established and start sending messages with the content you want to convey to them. When you have finished sending the message, end the communication. Tell the person you are interrupting the communication. We can say that communication is established when you do something conspicuous that causes the other person to pay some attention to you. Establishing Communication - It is preferable for the message to be sent in both directions to make sure that the other person gets what you want to say.

Once communication is established, the neural circuits in one nervous system output a symbolic message outside the body, which is then deciphered and obtained by the other nervous system. In order for the other to be able to decipher the symbol, the two systems must agree on the meaning of the symbol in advance. A common knowledge, so to speak, is needed, which can ultimately be seen as a commonality of senses at the genetic level of mankind. (The apple is, in principle, commonly perceived by humanity as a round shape with a red color.) This may be attributed to the commonality of innate neural circuits in the sensory cortex of the human brain.

The process of separating communication as an individual psychological process into individual units is specifically designed to measure which parts of the cranial nervous system are activated when humans communicate with others, using instruments such as

MRI to measure brain activity, independently for each individual, and to identify the type of communication That it may be possible to classify them separately. (i.e., each stage of communication from start to finish, the richness of the conversation, the content of the topic, the degree of liking or disliking the other person, etc.) It is assumed that such communicative interaction activates a specific part of the nervous system, the ‘communicative area’. In other words, the communicative area is activated only when there is a connecting connector between individuals, and it is activated during communication with others.

The communicative field, as a type of social field within the nervous system, is the key to elucidating how the generation of a “connecting connector” between individuals occurs. (2) Social awareness field

(2) Social Cognition Field

The social cognitive field can be viewed as a part of the nervous system that writes down knowledge and experiences about the part-whole society as a collection of others, and about the relationship between those societies and the self, as well as thoughts and perspectives. This field is a part of the nervous system that records and analyzes what is happening in the relatively microscopic sub-societies that are part of the larger whole society, such as the family, school, company, and community, as well as the macroscopic whole society, such as the nation, ethnic group, and the world, to see what is happening and how they relate to each other, and in what directions they are moving. It can be said that the social cognitive field is the part that considers what is desirable and puts it into practice.

The social cognitive field is the accumulation of knowledge and thought about various types of social relations, from geographical relations, blood relations and circles, to the workplace and the Internet.

The social cognitive cortex can be regarded as the area that is activated when the concept of social relations is introduced as a stimulus from outside.

Possibilities of the motorized nervous system

1987-2018 First published.

Conventional organisms - The human nervous system can only survive if the temperature is within the range of its possible existence as an organism, and if food and oxygen are available.

So, if the environment for humans changes so drastically that food and oxygen are no longer available, how do we keep the neural circuits that have traditionally been accumulated in the human biological nervous system alive? One of the answers is to transfer the neural circuits of the biological nervous system to the motorized nervous system, which is powered by electricity.

In this case, the motorized nervous system is not the conventional Neumann-type computer, but a neurocomputer that runs on electricity. (Or even a simulation of a Neumann-type computer neurocomputer.) In a motorized nervous system, the nervous system can survive if the energy for its activities can be obtained in the form of electricity. For example, if it is possible to generate sufficient electricity from sunlight or geothermal energy, the motorized nervous system can be easily sustained without oxygen or food.

Traditionally, it has been said that the essence of human beings lies in the fact that they are organisms brought about by the action of their DNA genes. However, I think it is more appropriate to say that the essence of human beings lies in the higher nervous system itself, which is responsible for advanced knowledge and thinking. This is because “brain death = inactivity of the nervous system” is equivalent to the death of a human being and is a target for organ transplantation.

Replacing the conventional biological-based nervous system with an electric or semiconductor-based system will enable humans to leave the limitations of the living body and open up a new world.

For example, in the past, the size of the human brain as a living organism has had certain limitations on its ability to act as a living organism, and this has limited our thinking and knowledge. However, electrification of the human brain removes these constraints, making it possible to think and accumulate knowledge at high capacity. Alternatively, humans as living organisms are destined to die eventually, at which point their biological nervous

systems will cease to function and disappear. However, by electroencephalizing him, he will be freed from the yoke of death, and will be able to continue his activities in a semi-permanent "immortal" manner.

If the essence of the human being lies not in being a living organism but in being a nervous system, then the electric nervous system can be a more advanced and permanent nervous system than the human-based organism, and it strikes at the essence of the human being as a being that is more "human-like", thinks and accumulates knowledge than the human being as a living organism. There is a good chance that it will be the one that has been used in the past.

In this case, it is important for the motorized nervous system to have an impulse to life in order to give it the same function as the conventional biological nervous system.

Conventional computers have been forced to have an intelligent, sober, objective perspective, without the impulse to live.

In the new motorized nervous system, on the other hand, it is necessary to have an emotional aspect with an impulse to survive.

The impulse for life is intrinsic to the organism, and it includes the desire to have sex and make genetic copies of oneself, to eat, to escape or defeat an external enemy, or to control others, to make friends, or to spread one's ideas.

By providing the motorized nervous system with circuits corresponding to these impulses to life, the motorized nervous system becomes a living organism that tries to survive on its own.

Alternatively, it is necessary to give the motorized nervous system the ability to generate neural circuits that have the function it desires, or to create circuits and nervous systems that replicate itself.

In order to make the electric motorized nervous system work in this way, it is necessary for humans to develop sufficient neural circuit design technology similar to the current LSI design technology, such as this kind of neural circuit or connecting this neural circuit to that neural circuit.

In this way, by leaving the motorized nervous system behind,

humans will be able to maintain human culture in the form of the motorized nervous system, even if the environment of the earth changes so drastically that humans cannot live as an organism, as long as there is electricity and physical materials to produce the motorized nervous system.

On the other hand, if the motorized nervous system is interconnected and extended through cables or radio waves, it will be possible to make the nervous system work on a scale never seen before, removing the spatial limitations of the conventional biological nervous system.

Neuron map

2009 First published

Neuron Map

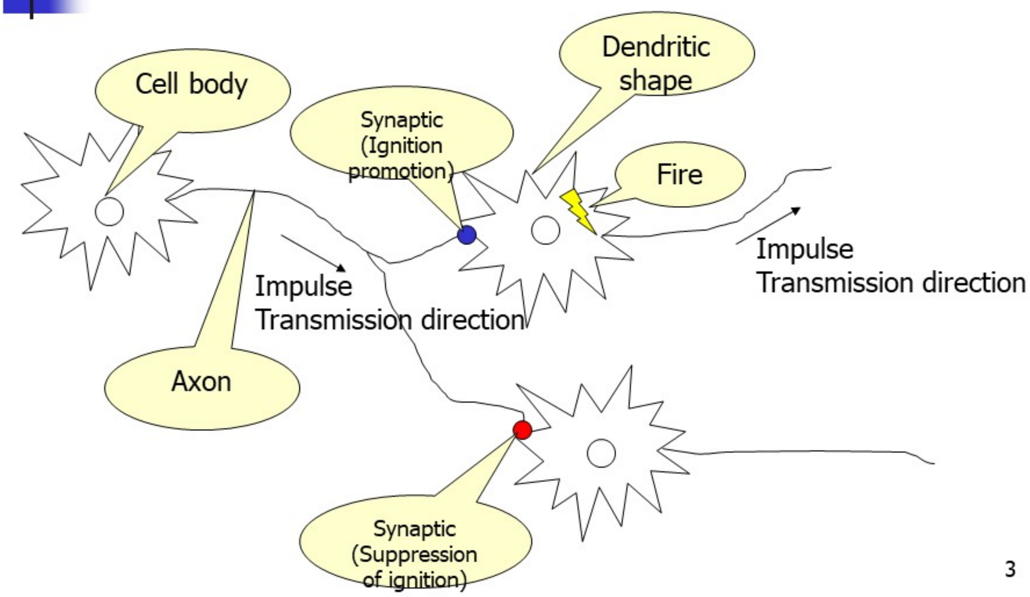
2009.10

Iwao Otsuka

What is a neuron map?

- Human beings think in the brain nervous system.
- When human thought and wisdom are arranged, it becomes the neuron circuit of the brain nervous system.
- To summarize ideas such as sentences, it is effective to make a diagram describing the relationship between ideas in the form of a neuron circuit.
- This figure is called "neuron map".

Neuron circuit



How to write a neuron map

- (1) The contents of the thought are individually written in the cell, one at a time.
  - The objective facts and subjective opinions and feelings (intention, value judgment) are described separately.
  - The objective fact is that
    - Something that will be a plus for me (saved, useful...)
    - What becomes a minus (trouble, problem, obstacle...)

    It is divided into, and color-coded.
  - Subjective opinions and feelings (intentions, judgment of values) are
    - Positive positive things (like, good, likes)
    - Negative things (I don't want to, I hate it, no, I don't like it)

    It is divided into, and color-coded.
  - Depending on the importance of the content, the tint of the color is attached to the dark (important) to pale (unimportant).
  - With objective facts, subjective opinions and feelings,
    - own personal stuff
    - Other people's Stuff

    Separating and marking.
- (2) Each cell is connected by a line (equivalent to an axon) and is bound (equivalent to synapse).
  - The line type is
    - Causal one-way "hence" "
    - Related, correlated two-way

    Separating and filling out.

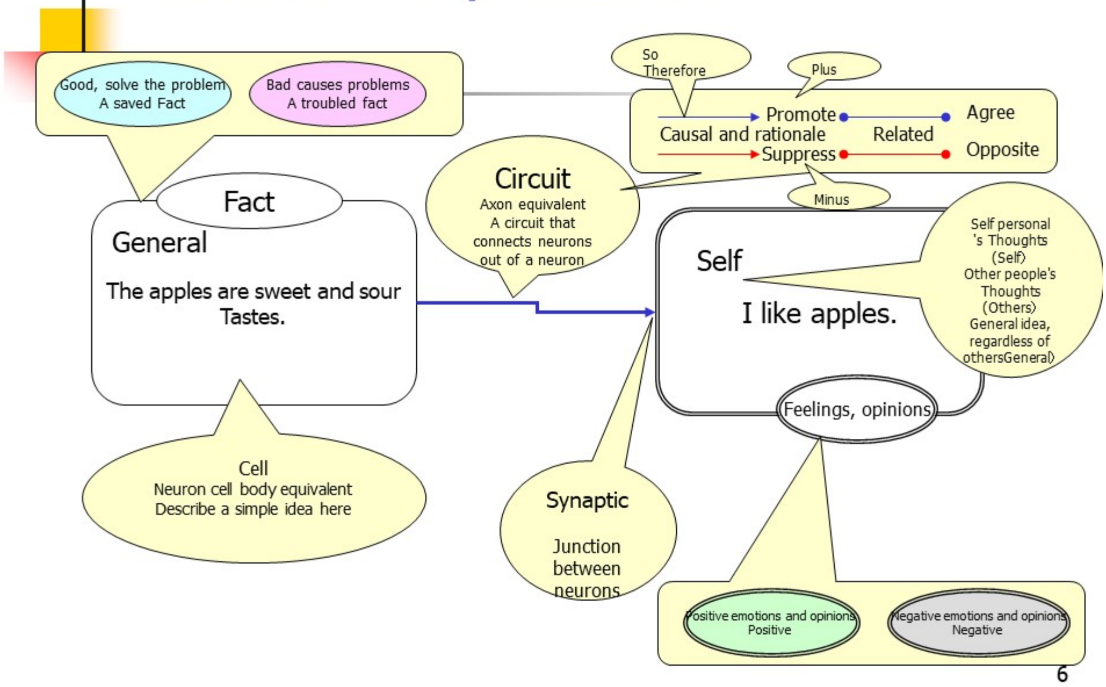
    - Activate or ignite a cell that is in a promoted destination
    - Suppressing the activity of the cell that falls to the destination and does not ignite

    In a separate form.

Software required to create neuron map

- Any software with drawings of the following functionsOk
  - Write a rectangle
  - Can I write a connector line connecting the squares together?
  - Can adjust shape, line color
  - Can adjust shape and line thickness
  - Can adjust shape and line pattern
- Examples of software that can be created
  - Microsoft Excel、Microsoft PowerPoint
  - OpenOffice Impress

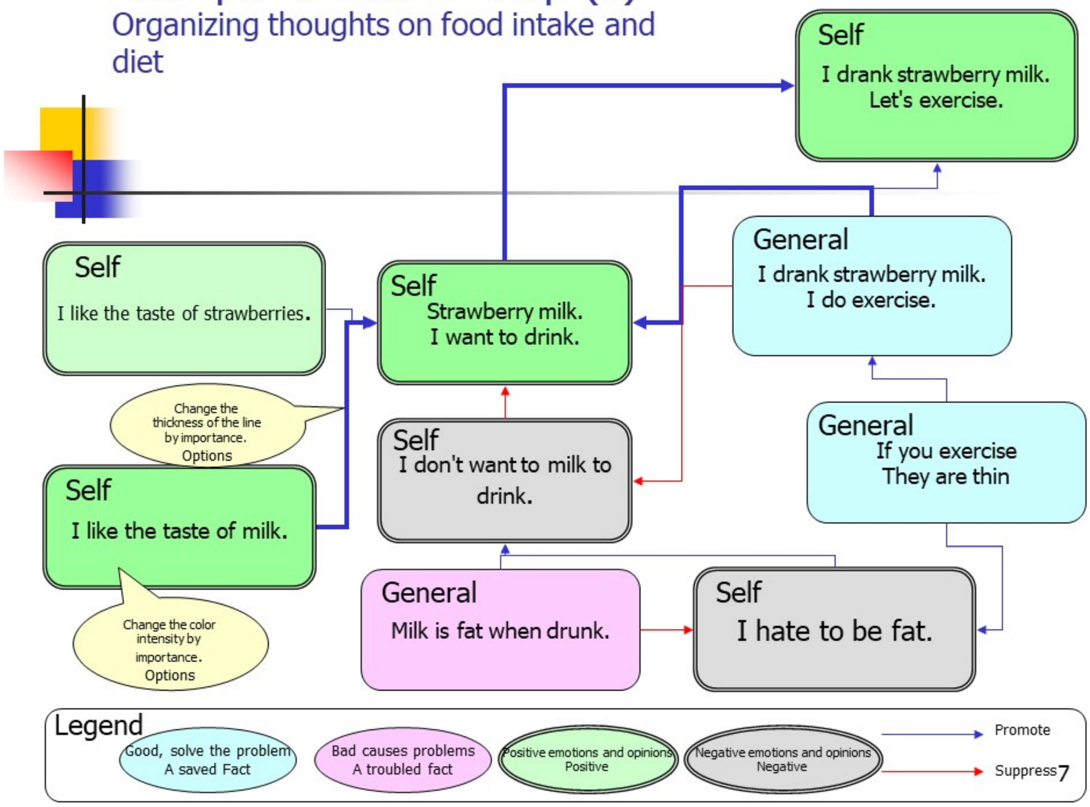
Neuron map format



6

Example of neuron map (1)

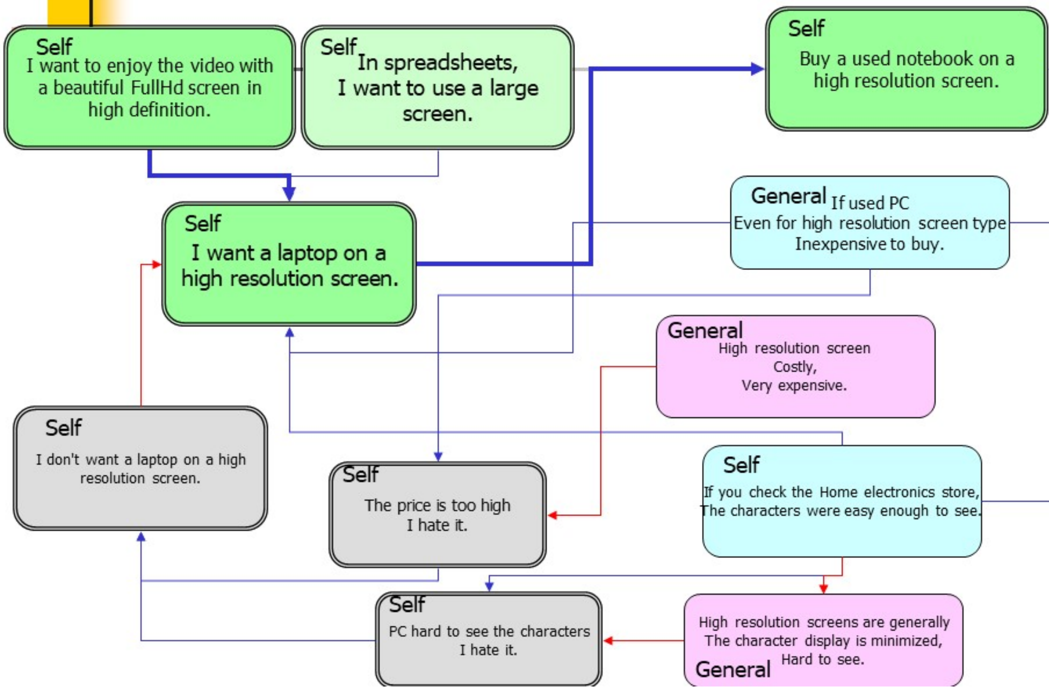
Organizing thoughts on food intake and diet



7

Example of Neuron map (2)

High resolution screen consumer thinking about purchasing notebooks



The benefits of writing a neuron map

- By drawing a neuron map, the content of thoughts that you hold in your head is arranged, and it becomes easy to explain coherent to others. It becomes easy to summarize in sentences.
  - In my thoughtsWhat is a plus for me and what is the negative?Can be organized and clarified.
  - In my thoughtsWhat is an emotional, subjective opinion, and what is an objective fact?Will be able to argue, organize, differentiate.
  - In my thoughtsWhat is a problem and what is the solution?Can reveal the flow of what is going on with them and their own opinions.
  - Hold oneselfFeelings of likes and dislikes, positive negative feelings, "I want to do not want to do" intention, "〇 〇 Good, bad" value standardCan clarify and organize what it looks like.
  - Mutual relation and flow of thought contentThe way of thinking becomes clear, and the flow of my thought is clarified, and it is possible to sentence it easily.
  - Not only logic, but also the content and flow of emotionscan be clarified.

Example of use of neuron map

- Psychological Counseling Support
  - The inner heart of the patient
    - The objective facts surrounding the patient
    - On the other hand, the feelings of the patient
  - To reveal and organize
    - What kind of prescription will help the patient (or counterproductive)?
  - As a technique to be able to share coherent with patients.

- Various product development Support
  - The circumstances and the intentions of the people and the company surrounding the product
    - Objective recognition of the market surrounding our company
      - Such products are useful and necessary
      - This kind of product is harmful, unnecessary
    - The feelings and intentions that we have
      - I like this kind of product, the feeling of being good
      - The intention to make this kind of product
  - Coherent and organize
    - Key persons inside and outside the company
    - The consumer who buys the product
  - As a technique that can be presented to the

Future of Neuron Map

- Elucidation and illustration of human brain neuron circuits
  - By writing a neuron map, it is possible to estimate what is the neuron circuit developed in the human brain.
  - It is useful for elucidation of the software of the brain nervous system.
  - Not only the intellectual and logical aspects, but also the aspects of emotions and intentions, can be clarified about the neuron circuit.

- Organizing the contents of human intellectual assets and the library
  - It promotes the illustration of contents written in various documents of the past.
  - It is easy to see and organize the various knowledge and feelings that the author has, and the judgment of value.
  - For example, is it effective for the content arrangement and the review of a great past?

- Neuron map and automatic sentence generation
  - When you click on the neuron on the diagram, it fires and the impulse transmits one after another.
  - Is it convenient that automatic tracking of the impulse flow of neurons on the

Minimal nervous system.

2020.10 First published.

Sociology of the Minimal Nervous System.

Intellectual particles. Emotional particles. The electronic realization of simple living thing that operates with intelligence and emotion. That nervous system is minimalist. It is the smallest unit of the nervous system.
The minimal nervous system. minimum nervous system. its sociology. It is the following content. The creation of a minimal nervous system by computer simulation. To make those nervous systems interact with each other socially.

Minimal nervous system. Interactions between them. Their clarification. Its significance.
(1) The ability to explore the nature of the nervous system.
(2) To be able to elucidate the psyche of living thing with simple brains, such as insects and fishes. To be able to elucidate the changes in their mental states, especially when interacting with other organisms.
(3) To be able to trace the origin of the behavior of living thing with complex brains such as humans. To be able to elucidate their society in the form of a simplified model.
(4) Individuals of living thing that protect inertia and individuals of living thing that break down inertia. To be able to know the boundaries and differences between them in terms of their behavior in the form of a simplified model.

Differences from previous knowledge.
(1) The name of the sociology of neural circuits. It is no different from existing explanations of neural network technologies.
(2) Existing neurosociology attempts to explore the correspondence between human social behavior and brain activity by means of MRI scans of live human brains. The neural network is not mentioned there.

The components of the minimal nervous system.

(1) Input. Reason. Emotion. Memory. Intentions. Output.
(2) Adjectives that characterize the content of each.

(1-1) Input.
(1-1-1) Senses. Perception. Receiving.
(1-2) Memory.
(1-2-1) Memorization. Forgetting. Repression. Calling.
(1-3) Emotions.
(1-3-1) Pleasure. Discomfort.
(1-3-2) Like. Dislike.
(1-4) Reason.
(1-4-1) Correct. False.
(1-5) Intention.
(1-5-1) To be enthusiastic. Unenthusiastic.
(1-6) Output.
(1-6-1) To transmit. (Example. Vocalization.)
(1-6-2) Causing muscular action.
(1-6-3) To move one's eyes, ears, or other parts of one's body to pay attention to one's surroundings.

(2-1) Semantic. Episodic.
(2-2) Short term. Long term.
(2-3) Positive. Negative.
(2-4) Surface. Deep.
(2-5) Internal limitation. External Exposure.

By multiplying (1) and (2) above, the behavior of the minimal nervous system is expressed. The behavior of one nervous system interacts with another nervous system to manifest the society of the minimal nervous system.

The society of living thing. The nervous system of living thing. Simulation of them.

Artificial generation of living nervous systems and societies of living things. Generation and interaction of micro-neurocomputers. The practice of generating real program source code. An overview of those procedures.

////
Existing neural circuit simulators aim to reproduce large-scale neural circuits inside individuals.
They do not assume the interaction of neural circuits between multiple individuals. This is where we need to create our own.
In a simple multi-dimensional array, the first is the individual number, the second is the number of each part of the network, and the third is the ID of the neuron.
Or, in a python array, take a list of lower-order arrays and put them into higher-order arrays one step at a time, and then put that list into higher-order arrays.

////
What needs to be done. Design requirements. Issues to be considered. Unknown and unidentified requirements. The initial content of the proposed solution.
The first thing to do is to put them together, write them into an e-book, and publish it for now. That is the first priority.

////
(1) Conventional physiological brain position-based considerations.
(2) Design and discussion of function-based micro-neural system models by the author.
(2) above is more informative and more easily gets to the heart of the essence of the nervous system of living thing than (1) above.

////
In order to reproduce the behavior of living thing, it is necessary to reproduce the behavior of sensory cells (receptors) and muscle cells (outputs) inside the individual.
Existing neural circuit simulators do not target the reproduction of these behaviors. We need to create our own.
In this case, we do not need the exact physiological behavior of the nerve cells at first, but rather we need to create a rough behavior.
Create an array of receptors and outputs. Incorporate them into the array at the individual level.

////
For neurons, there are three types of connections that need to be considered

Fixed invariant connections. Learning plastic connections. Novel connections that find new connections by trial and error.

Fixed or newly acquired connections.
Fixed thickness of connection or variable through learning?
Heredity and culture in connections.
It is necessary to consider these factors.

Currently, existing simulators of neural circuits only have fixed connections.

To acquire new connections, we need to refer to the movements of amoeba.
This can be achieved by automatically and randomly selecting the destination cells by trial and error.
The list of connections should be created for each neuron, with the following distinctions
Facilitator and inhibitor. By thickness. By plasticity.
Create a firing threshold for each neuron.
Make a list of them for each neuron.
Incorporate the array of these neuronal attributes into the individual-level array.

Connections that have been made by trial and error, but are invalid or harmful to living thing's own adaptation to the environment.
It is necessary to implement a process to virtually eliminate them.
It is garbage collection in the nervous system.

////
If we think only about the inside of the individual, we cannot take into account the environmental changes outside the individual.
Inorganic environmental changes. Environmental changes caused by the activities of other individuals. Environmental changes caused by the activities of the individual.
It is necessary to take each of these into account.

////
We need to take into account the physical movement of individuals.
Set the current position of the individual.
Spontaneous movement and standstill by individuals. Make them happen.

Actions to satisfy the need for food, clothing, and shelter. Actions to satisfy reproductive needs. Manifestation and actualization of these actions. Movement and stillness for this purpose.

////
Interactions between individuals. Communication between individuals.
Their manifestation and actual action.
Language and symbols used for this purpose. Their preparation.
Heredity and culture in them. The existence of both of these is assumed.

////
Inherent in the will and spirit of living thing that wants to continue living.
It is necessary to reproduce it in a small neural circuit.
Automaticity. Spontaneity.
The automatic, continuous beating of the heart. The infinite loop of biological activity.
The automatic, periodic activation of tasks in biological activity.
It can be achieved in the following ways
Running an automatic infinite loop routine inside the program.
Running automatic periodic task startup at a constant frame rate inside the program.

////
It is necessary to set and realize the life sustaining emotions of living thing.
Pleasure and discomfort. Approach and avoidance. Trust and distrust. Relief and anxiety.
The existence of pain sensations that warn living thing of danger or inadequacy.
These are realized as automatic control mechanisms for the facilitation and inhibition of junctional synapses in neurons.
Positive and negative for life support. Judgments and instructions.
This mechanism will be built into the neural circuitry.

////
Learning.

When to make a facilitative junction, and when to make an inhibitory junction.
A mechanism to determine them.
It must be built into the neural circuitry.
In the nervous system of living thing, there are excitatory or facilitative neurons and inhibitory neurons.
The distribution of the number of both types of neurons in the nervous system is 80% facilitative neurons and 20% inhibitory neurons.
Facilitative neurons form facilitative synapses. Inhibitory neurons form inhibitory synapses.
The inhibitory neurons suppress the movement of the facilitatory neurons.
In what cases does it promote junction thickening, and in what cases does it inhibit junction thickening?
The mechanism that determines this.
It must be built into the neural circuitry.
The formation of autonomous, facilitative and inhibitory synaptic connections by the neuron in question. The formation of subordinate, facilitatory and inhibitory synaptic connections based on the transmission of commands from other commanding neurons.

////
Memory.
The physical writing of a record.
Forgetting. Something you want to remember but cannot. To repress so as not to remember. Inability to write. The inability to write, even if one tries. Disappearance of writing once done. Inability to retrieve a post once it has been made.
Recalling behavior. Memory retrieval behavior.
Failure or death of the writing area. Dementia.

////
Consciousness. Unconsciousness.
The state or content of activity of the nervous system. Its internal classification.
The part that living thing itself is aware of. The part that living thing itself is not aware of.
The part that has feedback to the living thing itself. Parts that do not have feedback to living thing itself.
The contents of sensation and perception. Their manifestations and

potentials.
These are the activities of different parts of the nervous system.
Unconscious activity takes precedence, and the conscious mind follows and recognizes it.
Reactions to the environment are first handled by the unconscious, and then made explicit by the conscious.

////
Thinking.
Thinking that is based on emotion and lacks calmness. Calm thinking, neutral from emotion. Logical thinking.
It is necessary to distinguish between them.
Right and wrong. Pleasant and unpleasant sensations. The facilitation and inhibition of neuronal synapses based on those distinctions.
Their fixed, unlearned, circuit configuration. Their plasticity through learning.
Their prior classification is necessary.
It is necessary to operate the neural circuits in a way that distinguishes them.
Nervous system or endocrine system of the value center. Value centers in the nervous system. A mechanism that judges, decides, and commands what is more important for the survival of living thing. It is necessary to set them up.
Let’s try to envision a form in which signals for action command come down from the higher value centers to the lower senses, memories, thoughts, and movements. The relationship between the value centers and the centers of emotion and affect. They may be the same entity.

////
The contact and collision of an individual with inorganic matter or another individual.
Inorganic matter and other individuals contacting and colliding with the self.
Their physical motion. It is necessary to take them into account.
Use existing molecular motion programs and action games as references.

////
The actions of living thing. Its success and failure. The mechanisms of judgment and decision making. The intrinsic nature of these mechanisms in the nervous system. The control of synaptic facilitation and inhibition by these mechanisms.
The importance of the existence of feedback and feed-forward control over behavior.
It is not that there is a dedicated circuit. It is handled by matching prior memories with posterior sensations and perceptions.
The acquisition of feedback and feedforward by parents in the process of nurturing their children. Elucidation through simulation.

////
Simulation of sleep.
Sleep of living thing and dreaming of living thing during sleep. Elucidation by simulation.
When nerve cells fire frequently, they become energy-depleted, lacking the energy needed to fire, fatigued, and listless.
The nerve cell becomes unable to fire and cannot function as it is.
In order to cope with this situation, the input from receptors in the external environment is temporarily blocked, and the nerve cells are recharged with oxygen and other energy.
This is what sleep is all about.
During sleep, the internal environment recharges and replenishes the energy needed for firing.
This process is similar to the process of recharging a smartphone that has been used too much and is about to run out of battery, by shutting off the power.
The mental result of the neuronal activity during the charging process is a dream.
These processes can be realized by simulation.

////
The death of a neuron. The effects of this on the surrounding neurons and the nervous system as a whole. The simulation.
Display the status of a neuron as a numerical value. Disabling the activity of dead nerve cells.

////
Simulation of life support behaviors.
Maintaining their own bodies. Simulation of this.
Acquisition of energy. Acquisition of nutrients. Acquisition of food.
Consumption of food. When food is acquired, it disappears from the environment.
When food is not available for a certain period of time, living thing dies.
Receptacle. The presence of food: 1, a positive integer. The absence of food, 0, is detected by separate cells.
Output device. Consumption of food. To reduce the number of values in the environment to zero. To reduce the number of values in the environment. -1. to cause those actions at a constant frame rate. 1. to cause those behaviors to occur at a constant frame rate. 0 in a receptor means that it will eventually die.
The amount of nutrients stored in the body of an organism. Increases when food is available. Decreases automatically at regular intervals. Starvation occurs when there is no more nutrients. This causes the following signals to occur A danger signal for life support.
Receiving these signals from your internal environment.
And death.
Trial and error repositioning when food runs out.
To prepare multiple environments with numerical values. Assigning numbers or ids to multiple environments.
Out-of-body environment. Internal environment. To distinguish between them.
To express such behavior in the nervous system.

////
Negotiation or bargaining with other individuals.
A struggle with another individual for an interest.
Reconciliation with other individuals.
Simulation of these.
Assigning numbers or ids to multiple individuals.
Existence of other individuals. Detection and perception of this by receptors and neurons.
Living thing and non-living thing.
Organic matter and inorganic matter.
To be able to distinguish between them.

////

Simulation of sex differences.
The behavior of living thing, male and female. It is the following content.
Male. Gaseous behavioral patterns. Gaseous molecular motion simulation.
Female. Liquid behavioral patterns. Liquid molecular motion simulation.
We do not use physical molecular motion simulations directly.
This is achieved by the difference in behavior between discrete orientation and proximity or integration orientation.
Feminine individual. The probability of outputting 0 when 0 comes from the environment and 1 when 1 comes from the environment. Its value is high.
Precedent-observing, precedent-synchronized individual.
Masculine individual. The probability of outputting 1 when 0 comes from the environment and 0 when 1 comes from the environment. Its value is high.
An individual who destroys precedent and establishes a new order.

////
Simulation of reproductive behavior.
Discovery of the opposite sex.
Automatic response to sexual advances.
Heterosexual courtship and its acceptance. Sex.
Producing offspring.

////
Living thing and society.
The sum of the nervous systems of each living thing. The entire society as a result of the synthesis.
Display of them in real time.

////
When creating the demo, do not start coding right away, but try to make the design as concrete as possible in advance.
Contents of the demo to be created.

A single neuron.
A living thing with a minimum of nervous system functions.
A list of neurons and a real-time display of each neuron's activity.

Assign a number or id to each neuron.
A single head of the input part of the neuron. The following information is displayed there, in color.
The number or id of the neuron, its area of existence, and whether it is facilitatory or inhibitory.
In the middle of the neuron, whether it fires or not is displayed in blocks and in colors.
In the output part of the neuron, the following information is displayed in a list format and color.
The next neuron to be connected. Their number or id, thickness, and whether they are learnable or not.
The number of connections. Their real-time increase or decrease.
Display them in a list format.
Display of those neurons in a list format, lined up vertically.

Receptors. Output devices.
Like neurons, assign a number or id to each of them.
In the middle of each neuron, a block indicates whether it is active or not.
In the case of receptors, clicking with the mouse activates them.
In the case of receptors, the following information is displayed in the output section.
The next neuron to be connected. Their number or id.
In the case of the output unit, when it is active, it leaves an imprint of its activity on the external environment.
The content of the imprint is displayed as a number, an id, or a color.

Multiple neurons, multiple nervous systems, and multiple living things.
To observe, monitor, and control these activities from a bird's eye view.
For this purpose, a controller for experiments on biological behavior.
To set them up.

The connection between cells and the activity status of each cell.
A bird's eye view of them.
Real-time graphic display.

////
Start by creating a function without a graphic display.
Receptors. Neurons. Output devices. External environment. Internal environment.
All of these movements should be programmatically created.

The demo display should be created only after those contents are realized.

(First published in January 2022.)

The contents of the simulation program for the nervous system that needs to be created. Points to consider in creating it.

////

Neurons.
Classification of the types. Facilitating neurons and inhibitory neurons.
Division of their functions. The receiving part. Aggregation. Judgment section. Firing section. Sending part.
Each of these should be an independent function or process.
Data transfer between functions and processes is necessary in each process.

The external environment sends data to the receiver in real time, each time at a certain frame rate. In an actual program, input data is sent to the receiver whenever it is generated by a button input by the program user.
Whenever a firing event occurs, the receiving section sends the event and signal, and the data to the tabulating section. Depending on the thickness of the connection with the previous cell, the size and quantity of the signal to be sent is changed.
The aggregation unit uses a conveyor belt to separate the results of the aggregation at a certain frame rate at a certain time, and sends the aggregated values to the judgment unit. Use the body's internal clock. If the body clock is not utilized. If you don't utilize the body clock, it will be impossible to enhance the junction of the neuron with the previous inhibitory neuron.
In order to generate an event only when the aggregate value reaches the threshold for a firing event, the decision maker sends a signal to the firing unit in a clockwise and regular manner to allow firing.
Whenever a fireable event occurs, the firing section receives the

event and sends the event and signal to the transmission section in a clockwise and regular manner.
The transmitter receives the transmission event and sends the data to each destination. The data is the same and common data for each destination. The data consists of the following A numeric value, either 0 or 1, indicating the occurrence of a firing event. A numeric value, 0 or 1, indicating whether the neuron's own type is a facilitating or inhibitory neuron.

//

The determination of firing in a neuron. The mechanism. Its timing.
Use the internal clock of each cell in the nervous system.
To classify the input data into facilitatory and inhibitory inputs at regular time intervals, and to aggregate them respectively.
If the accelerated input exceeds the inhibited input by more than a certain threshold, the system will fire at that timing. If the accelerated input does not exceed the inhibited input by a certain threshold, it shall not fire at that timing.
If it does fire. The receiving section of the accelerated input shall be enhanced. The receiving part of the suppressed input should be reduced or left as it is.
If no ignition occurs. The receiving section of the suppressive input shall be increased. The receiving part of the accelerating input should be reduced or left as it is.
The result.
The occurrence of firing and non-firing in each cell will be regular in time according to the body clock.
A cell that has an internal clock.
A cell that does not have an internal clock of its own, but uses and appropriates clock information from other cells that do have an internal clock.

//

Synapse.
It is a junction between nerve cells.
The transmitter of the previous cell. The receiving part of the next cell. Whether or not the firing signal data is transmitted between them.
Enhanced junction, reduced junction, or neglected junction based on the presence or absence of the passage of firing signal data in the receiving part of the next cell.

Junction enhancement and junction reduction or neglect based on the presence or absence of firing of the next cell at the receiver of the next cell.
The junction as a concept that integrates these actions.

Synaptic plasticity.
Neurons in general. Individual reception of feedback data from the firing part of the next cell to the receiving part of the next cell about the presence or absence of firing in the next cell, at each communication line in the receiving part of the next cell.

In the case of accelerating neurons. When the next cell also fires due to the data received from the previous cell. Learning to increase the number of received values at the receiver of the next cell. Amplification of the received values of the accelerating stimulus in the next cell. This must be done at every junction, every time.
In the case of inhibitory neurons. If the next cell does not fire due to the data received from the previous cell. Learning to increase the number of received values at the receiver of the next cell. Amplification of the received values of the inhibitory stimulus in the next cell. This must be done at every junction, every time.

In the inhibitory neuron, the movement is the exact opposite of the facilitatory neuron.

If the previous cell is a facilitating neuron. If the previous cell is a facilitating neuron, then only when the next cell fires, is it received as an event by the receiver of the next cell.
When the previous cell is a facilitating neuron. When firing in the next cell does not occur for a long time due to the reception of firing from the previous cell. When the firing of the next cell is suppressed, the receiver of the next cell learns to decrease the received values. The next cell learns to reduce the received values of the accelerating stimulus. This must be done at every junction, every time.

If the previous cell was an inhibitory neuron. When the firing of the next cell is inhibited, it learns to increase the number of received values. Amplification of the received values of the inhibitory stimulus in the next cell. This must be done at every junction, every time.
If the previous cell was an inhibitory neuron. When the next cell fires despite having sent inhibitory data, it learns to decrease the

received values. The reduction of the received values of the inhibitory stimulus in the next cell. This must be done at every junction, every time.

Whether the previous cell is a facilitating neuron or an inhibitory neuron. Whether the later cell fired or not. In total, there are four considerations.

Learning.
Using synaptic plasticity to spontaneously change the strength of connections between neurons to a form that is more adaptive to living thing's environment.
The simultaneous existence of both plastic and non-plastic neurons.
Signal output of the student. The signal output of the teacher's example. Reconstructing the nervous system to fill in the gaps.
Realization of back-propagation, like machine learning, at the level of multiple cells. It does not reflect the movements of the real nervous system. It is an afterthought in reproducing the movements of the real nervous system. It is necessary to devise another effective way to learn the nervous system.

////

The social division of labor among neurons. The nervous system.
The social division of labor among neurons within the nervous system. It is a system of the nervous system. They are as follows.

//

Memory.
Acquired connections between neurons. Their retention. Neurons that control whether they are maintained or not. Implementing the mechanisms of that control.
Short-term memory. Temporary memory.
Long-term memory. Persistent memory. Facilitative long-term memory. Inhibitory long-term memory.
Enhancement of memory content by facilitating neurons.
Suppression of memory content by inhibitory neurons.
The loss of memory function throughout the nervous system when neurons in an area cease to function.

//

Thinking.
The movement of a neuron from one place to another.
The random extension of tentacles from one neuron to another.
It’s like the migration of an amoeba.
The result. New neuron-to-neuron junctions are formed one after another on a trial basis.
That’s the equivalent of coming up with a new idea. It is a thought.
It is the implementation of those mechanisms.
The simultaneous existence of both neurons with mutually fluctuating connections and neurons without mutually fluctuating connections.

Relay. Mediation. Long-distance communication.
A nerve cell that relays and communicates with other nerve cells that perform different functions in distant locations in the social division of labor.

//

Emotion. Emotion.
The basic environmental adaptive behavior of living thing. These are the most important neurons for life support.
They are the central command neurons of the nervous system.
The nerve cells that control the peripheral nerve cells through facilitation and inhibition.
Their activities. Implementing the mechanisms of that control.

Confronting threats.
Emotion-based facilitation of behavior. Fear of a threat causes rapid movement in behavior, panicked and distraught. It is feminine.
Suppression of emotion-based behavior. Calm observation of threats.
Attack and defense based on them. Doing those things. It is masculine.
To have both of them, by separate neurons.

//

The foundation of life.
An action directly related to the basic life support in living thing.
Securing food, clothing, and shelter. The intake of water and nutrients into the body. Excretion of unnecessary substances from the body.

The nerve cells that control these actions.
They exist in the most central part of the nervous system. They are the basic parts of the nervous system.

////

Design and implementation policies in programming.
The implementation of a program should be done from the most important part of living thing. It is the part of the nervous system that is the foundation of living thing.

To represent neuronal activity as a collection of computer processes.
The multiprocessing capabilities of Python programming. Making use of them.
Dividing cellular activity into multiple functions. Assigning a process to each function.
Data communication between processes in multiprocessing. Queue, PIPE, memory sharing.
It is possible to generate new data communication partners by trial and error. It is possible to create new synapses.
PIPE is upwardly compatible with queues.

Set the value to be taken by the external environment. It should be possible to change the value manually.
Reading data from standard input. Keyboard. Mouse.
Writing data via files and reading data via receptors.
Using Tkinter software for Python to generate GUI-based screens with text boxes, buttons, etc., and input data to control the external environment from those screens.
To make the external environment itself a process. To launch the GUI for controlling the external environment as a process.

Creating a separate dummy receiver-numeric generator-transmitter and using it to debug the behavior of the neurons.

Each process, once started, should be left alone.
Each process should be suicide proof. Death of the cell due to lack of nutrition. Cell death due to lifespan. Make it possible to reproduce them.
Each process should be able to be generated later in an additional form. The generation of new neurons and the division of neurons

after the birth of living thing. Make it possible to reproduce them.

(First published in February, 2022.)

Related information about my books.

All the books I’ve written. A list of them.

Iwao Otsuka (Aug 12, 2020) Sex Differences And Female Dominance
Iwao Otsuka (Aug 12, 2020) 性别差异和女性主导地位
Iwao Otsuka (Aug 12, 2020) Половые различия и женское превосходство
Iwao Otsuka (Aug 12, 2020) 男女の性差と女性の優位性

Iwao Otsuka (Aug 12, 2020) Female-Dominated Society Will Rule The World.
Iwao Otsuka (Aug 12, 2020) 女性主导的社会将统治世界
Iwao Otsuka (Aug 12, 2020) Общество, в котором доминируют женщины, будет править миром.
Iwao Otsuka (Aug 12, 2020) 女性優位社会が、世界を支配する。

Iwao Otsuka (Aug 12, 2020) Mobile Life. Settled Life. The origins of social sex differences.
Iwao Otsuka (Aug 12, 2020) 移动生活。定居生活。社会性别差异的起源。

Iwao Otsuka (Aug 12, 2020) Мобильная жизнь. Урегулированная жизнь. Истоки социальных различий по половому признаку.
Iwao Otsuka (Aug 12, 2020) 移動生活。定住生活。社会的性差の起源。

Iwao Otsuka (Aug 12, 2020) Life Is Dark. Human Beings Are Dark.
Iwao Otsuka (Aug 12, 2020) 生命是黑暗的。人类是黑暗的。
Iwao Otsuka (Aug 12, 2020) Жизнь темна. Человеческие существа темны.
Iwao Otsuka (Aug 12, 2020) 生命は暗黒である。人間は暗黒である。

Iwao Otsuka (Aug 21, 2020) On Atheism and the Salvation of the Soul. Live by neuroscience!
Iwao Otsuka (Aug 21, 2020) 论无神论与灵魂的救赎。靠神经科学生存！
Iwao Otsuka (Aug 21, 2020) Об атеизме и спасении души. Живи неврологией!
Iwao Otsuka (Aug 21, 2020) 無神論と魂の救済について。脳神経科学で生きよう！

Iwao Otsuka (Aug 24, 2020) Dryness. Wetness. Sensation of humidity. Perception of humidity. Personality Humidity. Social Humidity.
Iwao Otsuka (Aug 24, 2020) 干性。湿气。湿度的感觉。对湿度的感知。性格湿度。社会湿度。
Iwao Otsuka (Aug 24, 2020) Сухость. Мокрота. Сенсация влажности. Восприятие влажности. Личностная влажность. Социальная влажность.

Iwao Otsuka (Aug 24, 2020) ドライさ。ウェットさ。湿度の感覚。湿度の知覚。性格の湿度。社会の湿度。

Iwao Otsuka (Aug 26, 2020) Gases and liquids. Classification of behavior and society. Applications to life and humans.
Iwao Otsuka (Aug 26, 2020) 气体和液体。行为与社会的分类。在生活和人类中的应用。
Iwao Otsuka (Aug 26, 2020) Газы и жидкости. Классификация поведения и общества. Применение к жизни и человеку.
Iwao Otsuka (Aug 26, 2020) 気体と液体。行動や社会の分類。生命や人間への応用。

Iwao Otsuka (Sep 3, 2020) Elements of livability. Functionalism of life. Society as life.
Iwao Otsuka (Sep 3, 2020) 宜居的要素。生活的功能主义。社会即生活。
Iwao Otsuka (Sep 3, 2020) Элементы благоустроенности. Функциональность жизни. Общество как жизнь.
Iwao Otsuka (Sep 3, 2020) 生きやすさの素。生命の機能主義。生命としての社会。

Iwao Otsuka (Sep 4, 2020) The laws of history. History as a system. History for life.
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